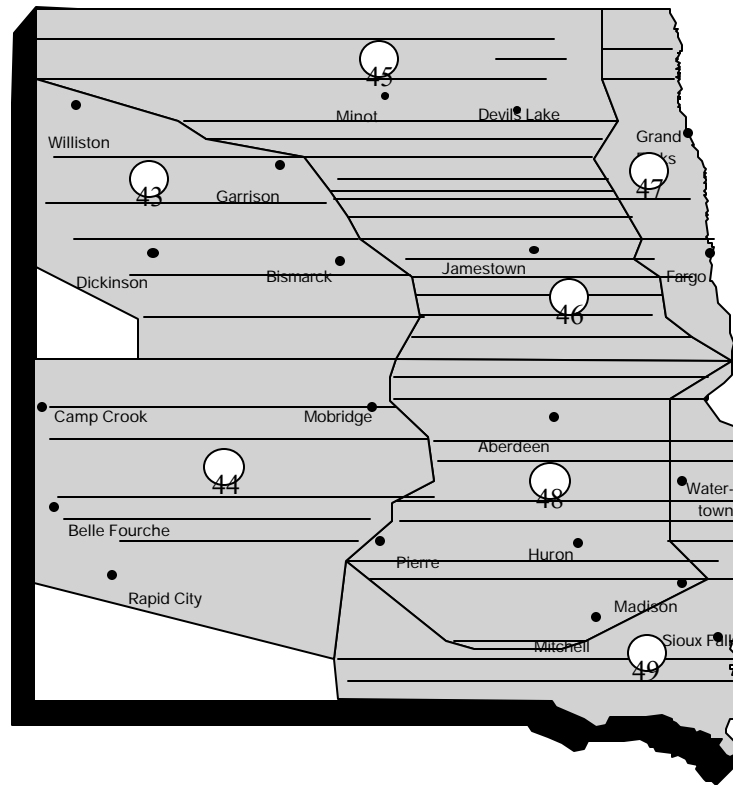


2005

**WATERFOWL BREEDING POPULATION SURVEY
FOR
SOUTH DAKOTA AND NORTH DAKOTA**



TITLE: Waterfowl Breeding Population and Habitat Survey for South and North Dakota

STRATA SURVEYED: 44, 48, 49 (South Dakota)
43, 45, 46, 47 (North Dakota)

DATES: 2 - 6 May 2005 (43 and 44)
5 - 26 May 2005 (45, 46, 47, 48, and 49)

DATA SUPPLIED BY: United States Fish and Wildlife Service

Strata 45, 46, 47, 48, 49

Aerial Crew

Observer/Pilot - John W. Solberg, Flyway Biologist, MBS/DMBM, Bismarck, ND

Observer - Michael Y. Rich, Private Lands Coordinator, Manhattan, KS

Ground Crew

Leader - Pam Garrettson, Wildlife Biologist, PHAS/DMBM, Laurel, MD

Assistants -

Kammie Kruse, Wildlife Biologist, DMBM, Denver, CO
Eric Lang, Biological Tech., Upper Souris NWR, Foxholm, ND

Strata 43 and 44

Aerial Crew

Observer/Pilot - Ray Bentley, Flyway Biologist, MBS/DMBM, Corvallis, OR

Observer - Helen Woods, Flyway Biologist (TR), MBS/DMBM, Laurel, MD

Ground Crew

Leader - Ken Richkus, Wildlife Biologist, HSS/DMBM, Laurel, MD

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ABSTRACT: The 2005 Waterfowl Breeding Ground and Habitat Survey for Eastern South and North Dakota was conducted 5 - 26 May using standard aerial coverage. Personnel changes in the eastern Dakotas occurred only in the ground crew. Both upland and over water nesting cover in South Dakota was degraded since 2004 but nesting cover in North Dakota was considered adequate. Wetland counts in 2005 were similar to those in 2004 (South Dakota 7%, North Dakota -5%). Compared to long-term averages, wetland indices fell short in South Dakota (-

38%) but were near average (4%) in North Dakota. General habitat conditions in the crew area ranged from poor to good. The estimated waterfowl breeding population in South Dakota (1.589 million) was 26% lower than the long-term average and the lowest since 1990. In North Dakota, the waterfowl breeding population (3.680 million) was the lowest of record since 1993 but remained 25% above the long-term mean.

Selected information for 2005 is presented below:

South Dakota

	2005 Indices (thousands)	Percent Change From		
		2004	1995-2004 mean	1959-2004 mean
Mallard	478.5	-11%	-47%	NC
Gadwall	282.3	-3%	-45%	21%
Blue-winged Teal	514.2	-10%	-61%	-39%
Northern Pintail	72.2	13%	-65%	-66%
Redhead	9.6	-30%	-82%	-80%
Canvasback	4.7	-39%	-26%	-25%
Total Ducks	1588.9	-5%	-55%	-26%
May Ponds	326.5	7%	-55%	-38%

North Dakota

	2005 Indices (thousands)	Percent Change From		
		2004	1995-2004 mean	1959-2004 mean
Mallard	1070.8	-7%	-16%	72%
Gadwall	522.4	-38%	-38%	36%
Blue-winged Teal	953.0	-13%	-44%	8%
Northern Pintail	212.8	-10%	-33%	-37%
Redhead	103.9	-36%	-53%	-24%
Canvasback	27.9	-26%	-36%	-6%
Total Ducks	3680.3	-17%	-31%	25%
May Ponds	761.1	-5%	-23%	4%

METHODS: The procedures followed in conducting the survey are described in the Standard Operating Procedures for Aerial Breeding Ground and Habitat Surveys in North America, Section III, revised 1987. There were no changes in survey coverage and all transects were flown (Tables 3 and 6).

East river personnel changes in 2005 occurred only in the ground crew. Eric Lang, a Biological Technician from the Upper Souris NWR in Foxholm, ND, joined the east river ground crew this year. Remaining air and ground personnel were unchanged since 2004. Crewmembers

participated in pre-survey training/review sessions relating to air and ground procedures. The aerial observer was critiqued regarding species identification, judgment of transect width, and adherence to standard operating procedures.

Visibility Correction Factors (VCF's) in the crew area are calculated using observations collected from 17 air/ground comparison segments. All comparison segments in the crew area are co-located with operational survey segments. The VCF for wetlands, established by comparison of air and ground observations, was 1.07. Wetland counts and all other data are considered comparable to all years when VCF's were determined.

Transect flying was accomplished in a wheeled Cessna 185. The survey required about 70 hours of flight time including reconnaissance. Aerial crews continued to utilize on-board computers and the Hodges program to capture georeferenced waterfowl and wetland observations. Aerial sampling commenced 5 May in the eastern Dakotas and was completed on the 26th. Once the survey was initiated, 8 days were forfeited to adverse weather. The common culprit again this year was wind, which exceeded 50 mph on several occasions. Information from Stratum 43 and 44 was collected 2 - 6 May by the Montana survey crew led by Flyway Biologist Ray Bentley. Our appreciation is extended to that crew for their efforts and contributions of data and habitat information from the Western Dakotas.

WEATHER AND HABITAT CONDITIONS: According to the U. S. Drought Monitor, South Dakota entered the fall of 2004 with the western 2/3rds of the state abnormally dry or in moderate drought condition. October brought big storms which delivered 3" – 5" of rain across much of the state. Temperatures were normal to slightly below. Precipitation continued in some areas through November and various locations ended the month with above average amounts received for the period. Temperatures during the month rose to 5° -7° above normal. December temperatures remained well above normal (9° - 11°) but the pattern of precipitation ended. No reporting station received over .16" of precipitation during December and coupled with the warm temperatures, any frost seal that may have been present in wetland basins disappeared. The dry conditions continued into the spring with many stations logging only minor amounts of precipitation since November (Huron 1.1", Aberdeen 1.6"). Only in the southeast (Sioux Falls region) did above precipitation fall. The prairie coteau benefited to some degree from May rains but the remainder of eastern portions received only minor relief (Huron .6"). At the time we initiated survey, most of South Dakota had received no more than 2" of precipitation since November. An exception was a major system that dumped heavy amounts of rain along the Nebraska/South Dakota border just prior to survey start. Total wetland counts for South Dakota were similar to those in 2004 (7% above) but was the second lowest of record since 1992. The 2005 index was 55% below the ten-year average and 38% drier than the long-term mean (Table 2).

In most areas of South Dakota east of the Missouri River, no temporary or seasonal water existed. Semi-permanent wetlands and dugouts ranged from completely dry to various stages of recession. Permanent wetlands usually showed some degree of recession and most streams were dry. The few streams containing water were often intermittent. On the drift prairie, nearly all dry basins had been tilled and planted this spring. Larger basins, in recession, had been tilled around as close as surrounding soil moisture would allow machinery. Where undisturbed,

vegetation in and around exposed basin bottoms, had begun to grow. In the Leola Hills, grazing activity was high and water conditions were similar to those on the drift plain. Because of generally poor water conditions, heavy grazing, and tillage impacts; nesting cover was below average for most parts of east river South Dakota.

SOUTH DAKOTA: (St. 44: 2 - 4 May, St. 48, 49: 5 -15 May)

Stratum 44 – Wetland counts in west river South Dakota decreased 25% since 2004. The 2005 index was well below the ten-year (43%) and long-term (30%) averages. The entire stratum was considered poor or fair habitat by the Montana crew.

Stratum 48 – Dry conditions prevailed again in 2005 in Stratum 48. Although the 2005 index was 29% above the 2004 figure, it was well short of the ten-year (-66%) and long-term (-48%) averages. Most of the Prairie Coteau was considered fair along with a narrow strip in the extreme southwest. Nearly the entire drift plain was considered to be in poor condition.

Stratum 49 –In Stratum 49, the wetland index increased 44% since last year. With a similar trend to that in Stratum 48, the wetland count in 2005 was 47% below the ten-year mean and 30% lower than the long-term average. The southwest and southeast regions, along with the coteau portion, were classed as fair with most of the remainder of the stratum considered poor nesting habitat.

October in North Dakota offered above average temperatures and generally modest precipitation to the state. The Fargo area was at the extreme and the recipient of a 5" rain. By month's end, temperatures had cooled and about half of the state reported adequate topsoil levels. November and December were quite mild with average temperatures well above (9° - 12°) normal. Thanksgiving brought about the only significant precipitation (in the form of snow) to the state in either month. The months of January and February were generally dry but January was cold where February was again, warmer than average. Snow cover, by this time, was predominantly in the northeast and along the eastern edge of the state but also occurred along the northern tier to a lesser extent. At the same time, central and south central portions of North Dakota lacked adequate snow cover. March brought "spring" temperatures (60°'s and low 70°'s by month's end) and the associated snow melt/wetland thaw. Small amounts of snow were received during March. Mild temperatures continued into April, but by mid-month, cooled to below average. Although by May, many areas of North Dakota had received only 40% - 80% of normal precipitation for the year, showers from mid-April through May began to improve waterfowl nesting habitat conditions. Temperatures during the last half of April and through May were cool and new growth nesting cover was slow to respond. Our index for total wetlands in North Dakota in 2005 was unchanged (-5%) since 2004 and was similar to the long-term average (4%). The 2005 figure was 23% below the ten-year mean (Table 5).

The situation this year was similar to 2004 where overall conditions at the beginning of the nesting cycle were better in North Dakota than in South Dakota. May showers in North Dakota actually improved wetlands and cover as the month progressed. Temporary and seasonal water, particularly in the eastern 1/3 of North Dakota, were present and agricultural impacts to basins and margin cover were much less evident than in South Dakota. Conditions in the northern half

of the Missouri Coteau offered similar conditions to those in the east, yet habitat conditions at the time of survey in a good portion of the drift plain were somewhat depressed. May precipitation in most areas maintained or improved levels in most semi-permanent and permanent basins

NORTH DAKOTA (St. 43: 4 - 6 May, St. 45, 46, 47: 16 - 26 May)

Stratum 43 – Water counts posted a modest increase (16%) since 2005 and were above the ten-year (32%) and long-term (60%) comparisons. General habitat conditions in the stratum were poor in the extreme southwest and good in extreme east central. The remainder of Stratum 43 was reported as fair.

Stratum 45 – An 18% decrease in the wetland count in Stratum 45 occurred since last year. The 2005 index was 28% below the ten-year average and similar to the long-term mean (-5%). Despite the decrease in the wetland index, we considered overall habitat conditions in 45 the best of any east river stratum. We rated over half of the area (generally the Missouri Coteau and nearly the eastern half) as fair or good but central portions of the drift plain and the coteau slope we considered poor.

Stratum 46 – Stratum 46 posted a 7% increase in water since last year. Although 41% below the ten-year average, the 2005 wetland index was just short (-12%) of the long-term average. Generally, the eastern ½ of the stratum was considered fair with the remainder being poor.

Stratum 47 – Wetland conditions in Stratum 47 in 2005 were similar to last year (9%) and the long-term average (6%), but were 27% below the ten-year mean. We considered a small portion of the central region of 47 poor with the remaining areas, north and south, ranging from fair to good.

BREEDING POPULATION ESTIMATES: The 2005 total breeding waterfowl estimate for South Dakota is 1.589 million birds. The estimate is similar to that of 2004 (-5%), but 55% below the ten-year average and 26% below the long-term average (Table 1).

The dabbling duck estimate in South Dakota was similar to last year (-5%) and below the ten-year (-54%) and long-term (-24%) figures. Gadwall (21%) and green-winged teal (67%) were above long-term averages and all other species were at or below the long-term comparisons.

The total estimate for diving ducks in 2005 was unchanged (3%) since last year. All individual diving duck estimates were well below their respective long-term averages.

The 2005 breeding population estimate for American coot was similar to last year and well below the ten-year (-90%) and long-term (-83%) averages. Canada goose estimates were unchanged from last year and the ten-year average but remained well above the long term mean (212%).

In North Dakota, the 2005 total breeding population estimate is 3.680 million birds. The 2005 estimate fell short of the 2004 estimate (-17%) and the ten-year average (-31%), but remained

25% above the long-term mean (Table 4).

The total dabbling duck estimate for North Dakota was 14% and 31% below last year and the ten-year mean but remained 27% above the long-term average. Breeding presence varied by species compared to last year but all dabblers except pintails (-37%) were near or above long-term averages.

North Dakota diving duck totals posted a decrease (37%) since 2004. Only redhead (-24%) and bufflehead (-81%) fell short of their long-term averages.

American coots were 84% below the 2004 figure and, following trends similar to those posted in South Dakota, fell short compared to ten-year (-90%) and long-term (-79%) averages. Canada goose estimates were above all three time comparisons (30%, 102%, and 654%).

CONCLUSIONS: Our timing of the 2005 waterfowl breeding population survey was proper based on; vegetation phenology, species composition, distribution, and social grouping. Weather patterns in the crew area from fall 2004 to spring 2005 provided wetland conditions similar to those of the 2004 breeding season. Beneficial rains, beginning about mid-May, maintained or improved conditions over much of North Dakota. Showers were later to arrive in South Dakota and were less beneficial as they were generally confined to northeast and southeast portions of the state. Although wetland counts were similar to last year in both states, only in North Dakota do they resemble long-term wetness (South Dakota -38%). Considering the depressed habitat conditions and the below average breeding population estimate in South Dakota, we suspect that some degree of over flight occurred again this year. Displaced birds could certainly have been attracted to the relatively better conditions in North Dakota or the prairie provinces of Canada.

Total duck breeding population estimates were similar to 2004 in South Dakota (-5%) but were 26% below the long-term average. In North Dakota, the total estimate fell 17% since last year but was 25% above the long-term mean. Mallard estimates were similar to 2004 (SD -11%, ND -7%) but only in North Dakota did they remain above the long-term average (72%). In South Dakota, mallards were at long-term levels. Northern pintails, in both states, remained below long-term averages (SD -66%, ND -37%). Relative to long-term averages, coots were well below historic levels in South Dakota (-83%) and North Dakota (-79%).

Based on habitat conditions offered to arriving pairs and at the time of our survey, we expect waterfowl production in the South Dakota portion of the crew area to be below average. In North Dakota, we project about average production from Stratum 46 and southern Stratum 47. We anticipate above average production in Stratum 45 and the northern half of Stratum 47.

It should be mentioned that following the survey, for nearly the entire month of June, cool temperatures and precipitation prevailed. Again, much of North Dakota reaped moisture benefits with many stations receiving 2" – 7" above normal precipitation for the month. Some areas in South Dakota were improved, but again the southeast and northeast benefited most. In terms of waterfowl production, it is unfortunate that much of the significant moisture arrived after nearly half of the nesting cycle had passed. Improvements/creation of wetlands should increase productivity and brood survival. Yet cool, wet weather does not bode well for brooding. Late

season nesting species and, to an unknown degree second attempt nesters, may benefit from these improvements. The affects of the late precipitation on waterfowl production may be indicated in banding samples or from the harvest survey.

John W. Solberg and Mike Rich
July 2005

Table 1. Status of waterfowl breeding population estimates (thousands, adjusted for visibility bias) by species and stratum with comparisons against the previous year, the previous 10-year mean, and the long-term mean (from 1959) for South Dakota.

Species/Ponds	Stratum (2005)			2005 Total	2004 Total	10-Year Mean	Long-Term Mean	% Change From		
	44	48	49					2004	10-Year Mean	Long-Term Mean
Ducks										
Dabblers										
Mallard	109.1	256.4	113.0	478.5	535.7	909.6	478.7	-10.7%	-47.4%	-0.0%
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	-100.0%
Gadwall	52.2	189.3	40.8	282.3	290.4	511.6	233.4	-2.8%	-44.8%	20.9%
Am. wigeon	12.1	18.5	0.8	31.4	23.1	49.6	38.9	36.0%	-36.7%	-19.3%
Am. green-winged teal	35.2	14.1	0.0	49.4	26.7	46.7	29.6	85.1%	5.7%	66.8%
Blue-winged teal	80.9	299.0	134.3	514.2	570.4	1314.3	836.8	-9.9%	-60.9%	-38.6%
N. shoveler	31.1	52.6	16.1	99.7	100.9	275.6	188.2	-1.1%	-63.8%	-47.0%
N. pintail	17.3	45.8	9.1	72.2	63.8	208.6	213.4	13.2%	-65.4%	-66.1%
Subtotal	337.9	875.7	314.1	1527.7	1610.9	3315.9	2019.1	-5.2%	-53.9%	-24.3%
Divers										
Redhead	0.0	7.8	1.8	9.6	13.7	51.5	46.8	-30.2%	-81.5%	-79.6%
Canvasback	0.0	1.7	3.0	4.7	7.8	6.4	6.3	-39.0%	-25.7%	-25.2%
Scaups	0.7	21.3	8.3	30.3	30.0	65.6	43.5	0.9%	-53.8%	-30.4%
Ring-necked duck	0.8	4.2	1.1	6.1	5.0	15.9	8.2	21.4%	-61.8%	-26.3%
Goldeneyes	0.0	0.0	0.0	0.0	0.0	0.2	0.3	--	-100.0%	-100.0%
Bufflehead	0.6	0.4	0.0	1.0	1.0	1.7	1.5	-0.6%	-40.0%	-33.6%
Ruddy Duck	0.0	7.1	2.4	9.5	1.9	41.4	31.8	398.2%	-77.1%	-70.1%
Subtotal	2.1	42.5	16.6	61.2	59.4	182.6	138.5	3.0%	-66.5%	-55.9%
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Scoters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	-100.0%
Mergansers	0.0	0.0	0.0	0.0	1.4	3.0	1.6	-100.0%	-100.0%	-100.0%
Subtotal	0.0	0.0	0.0	0.0	1.4	3.0	1.6	-100.0%	-100.0%	-100.0%
Total Ducks	340.0	918.2	330.7	1588.9	1671.7	3501.6	2159.2	-5.0%	-54.6%	-26.4%
Canada Goose	17.5	63.2	27.5	108.2	108.0	109.0	34.7	0.2%	-0.7%	211.7%
Am. coot	7.1	21.3	4.2	32.6	32.2	321.2	194.5	1.1%	-89.9%	-83.3%
Ponds	105.2	129.0	92.4	326.5	305.2	732.3	529.9	7.0%	-55.4%	-38.4%

Table 2. Long-term trend in adjusted May pond estimates (thousands) by stratum with comparisons against the previous year, the previous 10-year mean, and the long-term mean (from 1974) for South Dakota. Estimates prior to 1974 were not adjusted for visibility bias.

Year	Stratum			Total
	44	48	49	
1961	33.1	48.1	34.2	115.4
1962	69.5	152.3	95.7	317.4
1963	80.2	142.2	106.9	329.3
1964	62.0	79.3	56.8	198.0
1965	84.5	100.3	53.0	237.8
1966	94.5	143.6	79.7	317.8
1967	90.2	132.4	66.5	289.0
1968	71.8	146.0	61.1	278.9
1969	156.5	263.5	111.6	531.6
1970	161.3	183.3	58.9	403.4
1971	146.4	132.7	85.4	364.4
1972	205.5	263.8	108.1	577.4
1973	153.4	126.1	82.4	362.0
1974	68.0	186.0	125.4	379.4
1975	151.0	236.4	108.3	495.7
1976	92.9	121.8	93.1	307.8
1977	84.7	114.5	73.0	272.3
1978	212.3	307.4	131.5	651.2
1979	82.0	214.6	148.6	445.3
1980	66.8	108.4	88.3	263.5
1981	64.3	58.8	40.0	163.0
1982	148.1	176.7	73.7	398.4
1983	104.3	189.4	142.6	436.4
1984	142.8	262.4	189.4	594.6
1985	116.7	183.8	124.4	425.0
1986	216.7	260.5	132.2	609.4
1987	194.9	216.4	105.9	517.3
1988	92.5	99.9	114.4	306.8
1989	195.4	222.0	86.7	504.1
1990	124.0	79.4	56.7	260.0
1991	106.5	113.1	69.5	289.1
1992	107.5	96.8	61.6	265.8
1993	141.1	334.7	225.0	700.7
1994	281.1	356.5	180.9	818.4
1995	279.4	458.2	195.9	933.4
1996	324.4	418.2	172.2	914.8
1997	278.8	478.8	167.5	925.1
1998	195.3	337.8	162.0	695.1
1999	157.4	618.1	249.4	1025.0
2000	161.3	324.7	141.6	627.6
2001	105.3	562.9	320.9	989.1
2002	85.9	204.1	143.8	433.9
2003	111.9	240.7	121.4	473.9
2004	140.8	100.1	64.3	305.2
2005	105.2	129.0	92.4	326.5
10-year Mean	184.1	374.4	173.9	732.3
Long-term Mean	149.5	247.8	132.6	529.9
Percent Change:				
From 2004	-25.30%	28.80%	43.80%	7.00%
From 10-year Mean	-42.90%	-65.50%	-46.90%	-55.40%
From Long-term Mean	-29.70%	-48.00%	-30.30%	-38.40%

Appendix 1. Long –term trend in adjusted waterfowl breeding population estimates (thousands) in South Dakota.

Species/Ponds	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
Ducks										
Dabblers										
Mallard	108.2	176.6	212.1	367.3	535.8	261.1	314.5	216.3	248.2	450.7
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	0.0	9.9	18.9	73.9	164.0	53.6	115.4	112.9	75.1	197.8
Am. wigeon	7.1	9.6	6.1	8.1	3.1	4.4	0.0	9.6	29.7	22.6
Am. green-winged teal	0.0	0.0	2.7	10.0	2.7	0.0	0.0	7.7	9.6	23.5
Blue-winged teal	413.1	524.5	673.8	602.5	1201.5	686.3	703.6	623.9	313.7	466.1
N. shoveler	38.4	156.3	96.4	335.5	225.4	95.7	90.2	108.3	82.2	150.6
N. pintail	25.5	305.7	175.4	557.8	221.6	108.8	128.9	228.9	186.6	129.1
Subtotal	592.3	1182.5	1185.3	1955.1	2354.1	1209.9	1352.6	1307.7	945.1	1440.2
Divers										
Redhead	0.0	30.1	14.3	56.4	50.5	50.4	56.4	56.7	20.1	33.4
Canvasback	2.8	1.4	2.8	2.2	2.6	5.0	2.0	6.1	3.5	2.6
Scaups	13.6	18.3	8.1	32.9	11.0	1.4	29.2	29.7	11.2	22.3
Ring-necked duck	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.4	1.1	0.0
Goldeneyes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bufflehead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.9	0.0
Ruddy Duck	0.0	10.7	3.6	11.8	5.6	1.4	1.9	5.6	0.0	8.9
Subtotal	16.4	60.5	28.8	103.4	70.7	58.1	89.5	100.0	36.8	67.2
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Total Ducks	608.7	1243.0	1214.2	2058.5	2424.9	1268.1	1442.0	1409.0	982.0	1507.4
Canada Goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.9	0.0
Am. coot	31.1	40.4	29.3	61.0	21.0	53.4	19.3	33.8	28.0	75.7
Ponds										
Species/Ponds	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Ducks										
Dabblers										
Mallard	443.3	415.2	392.0	493.0	432.6	276.5	354.3	256.2	186.8	537.3
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	243.8	214.5	162.2	192.1	149.9	85.5	126.4	44.6	31.4	233.6
Am. wigeon	30.7	21.4	19.0	99.1	43.7	16.3	42.7	56.6	29.2	92.7
Am. green-winged teal	29.0	115.1	25.4	42.6	29.6	19.1	37.4	31.1	9.8	38.5
Blue-winged teal	742.2	706.8	654.3	1209.0	777.1	348.8	437.2	351.7	318.9	1287.3
N. shoveler	195.7	260.3	103.2	330.9	110.6	51.1	92.9	56.5	58.6	419.1
N. pintail	396.6	333.3	247.8	395.4	275.1	99.1	218.2	111.7	130.8	678.4
Subtotal	2081.2	2066.8	1603.9	2762.1	1818.6	896.5	1309.0	908.4	765.5	3287.0
Divers										
Redhead	87.8	53.6	60.7	48.6	34.6	20.2	27.3	4.1	10.8	144.4
Canvasback	17.9	6.1	2.8	14.2	13.1	6.4	5.6	3.1	3.0	12.3
Scaups	12.1	74.4	7.3	41.1	19.2	13.0	12.7	45.3	16.4	73.7
Ring-necked duck	0.0	1.1	0.5	0.0	0.0	0.0	0.0	0.3	0.4	1.4
Goldeneyes	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	1.0
Bufflehead	0.0	0.0	0.0	1.5	0.0	0.5	0.0	0.0	0.0	0.5
Ruddy Duck	7.0	39.3	27.7	30.1	18.6	23.2	209.7	6.2	5.8	28.7
Subtotal	124.8	174.5	99.0	136.6	85.5	63.2	255.4	59.0	36.4	261.9
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Subtotal	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Total Ducks	2206.0	2241.2	1702.9	2898.7	1904.9	959.7	1564.4	967.4	801.9	3548.9
Canada Goose	8.2	0.9	2.1	3.4	6.4	3.7	1.9	3.0	1.8	7.2
Am. coot	91.1	91.8	35.0	110.9	126.1	27.8	75.7	66.6	91.4	232.5
Ponds										
						379.4	495.7	307.8	272.3	651.2

Appendix 1 (continued). Long -term trend in adjusted waterfowl breeding population estimates (thousands) in South Dakota.

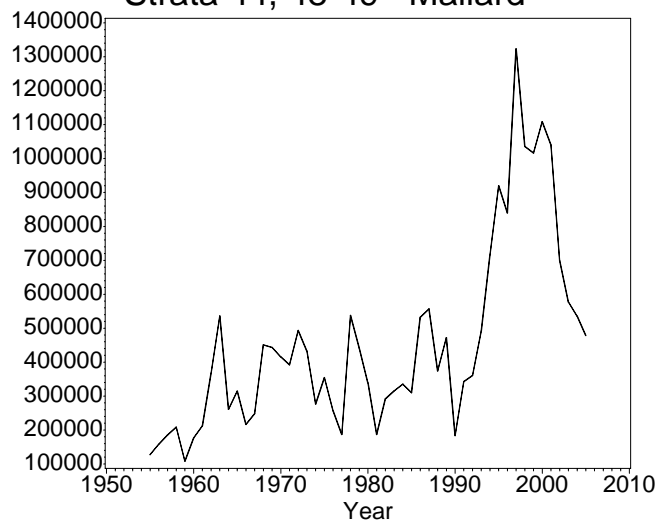
Species/Ponds	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Ducks										
Dabblers										
Mallard	441.7	338.9	186.8	291.7	314.9	334.9	310.1	532.0	556.8	374.1
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	136.7	69.8	113.6	189.1	219.0	263.7	145.5	254.3	205.7	222.5
Am. wigeon	33.6	41.5	60.0	40.7	73.8	87.0	45.2	39.7	45.6	48.8
Am. green-winged teal	19.3	70.2	21.1	34.9	36.6	22.0	31.6	52.1	23.4	25.5
Blue-winged teal	906.0	483.3	254.1	519.9	801.8	938.8	604.5	1433.5	777.1	617.1
N. shoveler	341.8	59.3	66.7	152.4	200.0	236.9	113.2	379.8	226.9	84.4
N. pintail	280.0	119.7	53.0	204.2	223.8	263.5	165.3	389.5	212.8	118.4
Subtotal	2159.0	1182.6	755.3	1432.9	1869.9	2146.9	1415.3	3080.8	2048.2	1490.9
Divers										
Redhead	50.9	28.2	22.0	45.2	82.9	111.9	35.9	64.2	34.1	19.3
Canvasback	5.6	8.0	5.9	2.2	2.3	15.8	4.6	11.5	5.7	7.6
Scaups	36.7	5.4	19.1	43.7	54.3	58.6	30.6	104.7	35.4	63.2
Ring-necked duck	0.6	1.2	2.8	7.1	59.0	17.3	1.4	18.3	14.4	5.7
Goldeneyes	0.0	0.0	0.0	1.2	2.4	0.8	0.8	0.8	0.0	0.0
Bufflehead	1.5	1.1	0.9	3.1	6.1	2.8	0.0	4.8	0.0	2.9
Ruddy Duck	16.0	21.6	67.0	84.4	88.9	48.7	23.1	69.4	28.5	3.2
Subtotal	111.3	65.5	117.8	187.0	295.9	255.8	96.5	273.6	118.1	101.8
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	2.5	0.8	0.0	7.0	5.7	6.1	0.0	0.0	0.0	2.1
Subtotal	2.5	0.8	0.0	7.0	5.7	6.1	0.0	0.0	0.0	2.1
Total Ducks	2272.9	1248.9	873.1	1626.9	2171.4	2408.9	1511.8	3354.5	2166.3	1594.7
Canada Goose	4.8	3.4	9.8	23.9	13.0	19.0	15.2	12.5	17.6	57.2
Am. coot	356.1	77.1	176.8	202.7	263.5	603.7	196.5	487.5	427.3	436.4
Ponds	445.3	263.5	163.0	398.4	436.4	594.6	425.0	609.4	517.3	306.8

Species/Ponds	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Ducks										
Dabblers										
Mallard	472.0	183.5	342.6	360.6	491.5	715.9	919.7	839.8	1323.2	1035.6
Am. black duck	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	177.7	125.7	282.9	281.5	246.6	383.0	541.5	451.8	819.5	624.2
Am. wigeon	21.6	27.4	44.4	32.9	17.3	83.6	46.8	47.6	71.3	74.6
Am. green-winged teal	24.4	8.5	17.0	12.6	6.6	55.2	58.4	63.0	69.4	34.3
Blue-winged teal	860.2	346.3	1075.4	626.4	679.9	1383.6	1468.4	1390.9	1535.0	1573.4
N. shoveler	185.4	79.2	117.2	102.0	213.4	283.5	350.0	287.6	414.3	230.3
N. pintail	148.3	63.4	69.8	65.7	166.7	230.1	364.2	187.3	349.9	205.4
Subtotal	1889.5	834.3	1949.3	1481.8	1821.9	3134.8	3749.0	3268.0	4582.7	3777.8
Divers										
Redhead	55.1	16.7	11.7	41.0	62.4	98.2	68.4	54.3	55.6	78.9
Canvasback	5.3	8.1	5.3	1.4	8.0	14.6	7.6	9.1	9.2	4.5
Scaups	80.4	43.5	66.8	47.9	7.3	155.2	120.9	94.6	75.6	87.4
Ring-necked duck	17.7	17.6	5.5	27.6	5.8	11.1	41.6	17.4	19.1	8.4
Goldeneyes	0.0	0.0	3.6	0.0	0.0	0.8	0.8	0.9	0.0	0.0
Bufflehead	5.0	0.5	1.2	7.5	0.0	12.0	5.9	1.2	1.3	0.6
Ruddy Duck	44.0	34.1	10.2	3.9	21.5	36.7	43.2	14.7	18.7	24.9
Subtotal	207.6	120.5	104.2	129.3	105.0	328.7	288.4	192.1	179.5	204.8
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	3.5	2.4	4.0	0.0	2.1	3.7	4.9	0.5	7.7	2.5
Subtotal	3.5	2.4	4.0	1.6	2.1	3.7	4.9	0.5	7.7	2.5
Total Ducks	2100.5	957.3	2057.5	1612.7	1929.1	3467.2	4042.3	3460.6	4769.9	3985.1
Canada Goose	65.4	46.2	44.2	48.6	37.7	46.5	55.9	73.5	86.8	99.8
Am. coot	284.7	191.5	77.4	132.8	167.2	311.0	616.9	409.9	525.7	469.0
Ponds	504.1	260.0	289.1	265.8	700.7	818.4	933.4	914.8	925.1	695.1

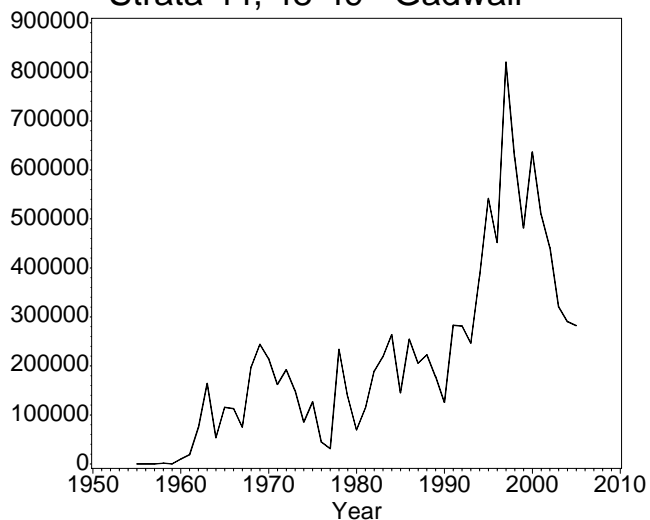
Appendix 1 (continued). Long -term trend in adjusted waterfowl breeding population estimates (thousands) in South Dakota.

Species/Ponds	1999	2000	2001	2002	2003	2004	2005
Ducks							
Dabblers							
Mallard	1016.4	1108.4	1040.5	699.3	577.5	535.7	478.5
Am. black duck	0.0	0.0	0.0	0	0.0	0.0	0.0
Gadwall	481.6	636.2	508.9	441.6	320.2	290.4	282.3
Am. wigeon	49.1	69.9	53.5	33	27.0	23.1	31.4
Am. green-winged teal	39.1	51.6	69.8	28.2	26.4	26.7	49.4
Blue-winged teal	1516.6	1576.9	1608.7	1043.1	859.9	570.4	514.2
N. shoveler	364.3	226.8	461.9	188.3	131.2	100.9	99.7
N. pintail	201.9	200.5	385.4	88.1	39.0	63.8	72.2
Subtotal	3669.0	3870.3	4128.7	2521.6	1981.3	1610.9	1527.7
Divers							
Redhead	56.0	33.0	51.0	75.6	27.7	13.7	9.6
Canvasback	2.9	6.7	5.1	7.8	3.1	7.8	4.7
Scaups	40.3	59.1	44.5	66.6	37.0	30.0	30.3
Ring-necked duck	25.7	10.8	8.7	13.3	9.9	5.0	6.1
Goldeneyes	0.0	0.0	0.0	0	0.0	0.0	0.0
Bufflehead	2.3	0.4	0.6	1.9	1.4	1.0	1.0
Ruddy Duck	82.1	65.9	58.8	75.6	28.0	1.9	9.5
Subtotal	209.4	175.9	168.7	240.9	107.0	59.4	61.2
Miscellaneous							
Long-tailed duck	0.0	0.0	0.0	0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0	0.0	0.0	0.0
Scoters	0.0	0.0	0.0	0	0.0	0.0	0.0
Mergansers	4.0	2.9	3.7	2.4	0.8	1.4	0.0
Subtotal	4.0	2.9	3.7	2.4	0.8	1.4	0.0
Total Ducks	3882.5	4049.1	4301.1	2764.9	2089.1	1671.7	1588.9
Canada Goose	111.8	165.3	169.9	88.7	130.4	108.0	108.2
Am. coot	458.6	300.9	141.7	235.1	22.5	32.2	32.6
Ponds	1025.0	627.6	989.1	433.9	473.9	305.2	326.5

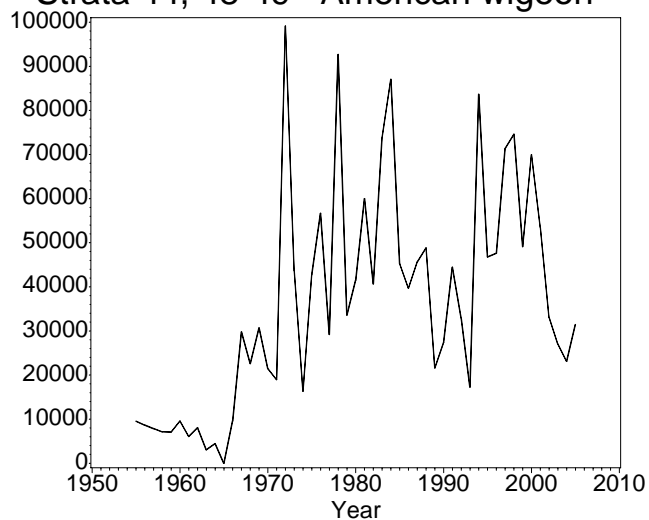
Strata 44, 48-49 Mallard



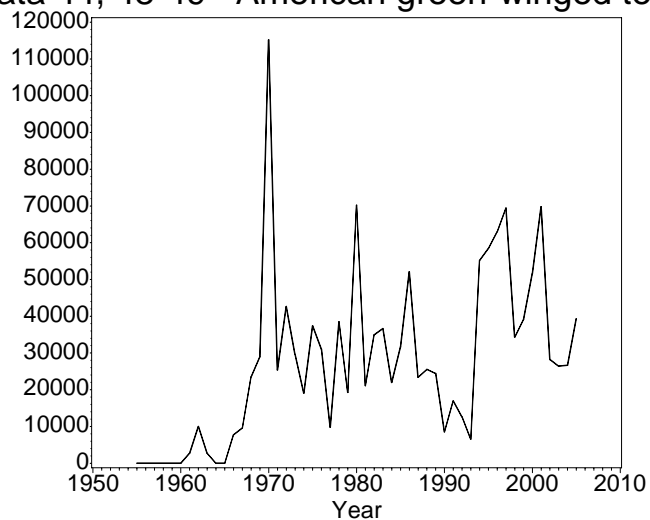
Strata 44, 48-49 Gadwall



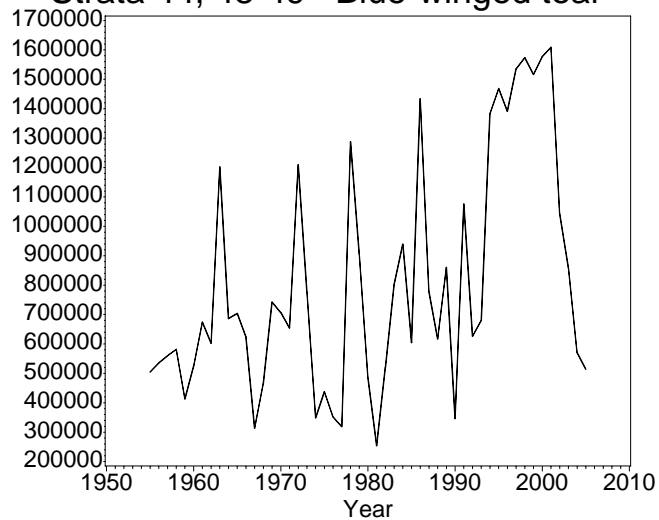
Strata 44, 48-49 American wigeon



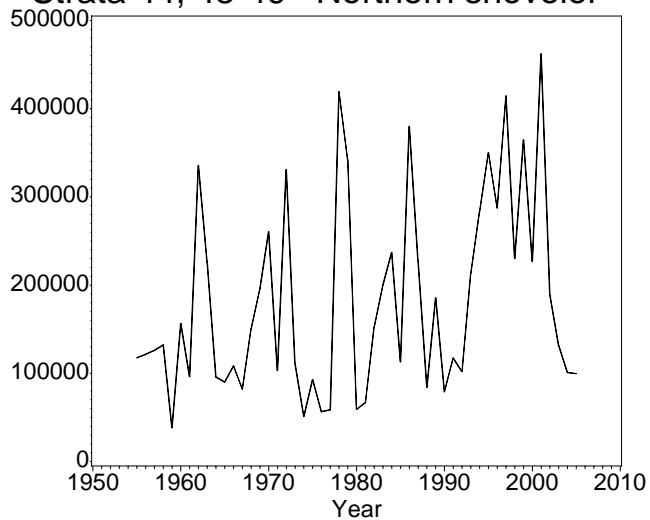
Strata 44, 48-49 American green-winged teal



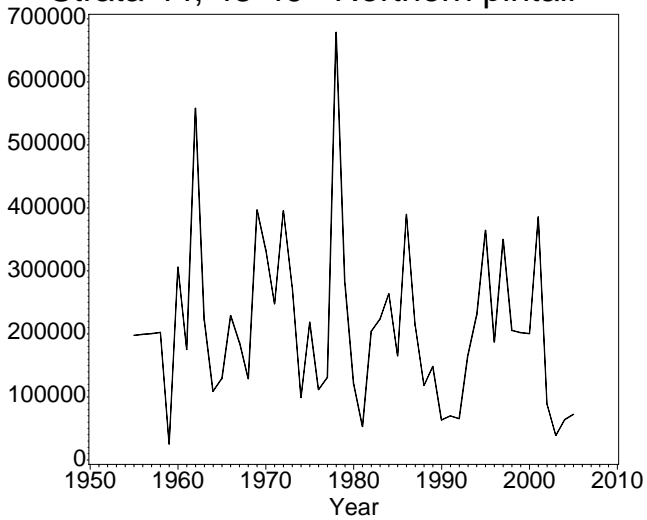
Strata 44, 48-49 Blue-winged teal



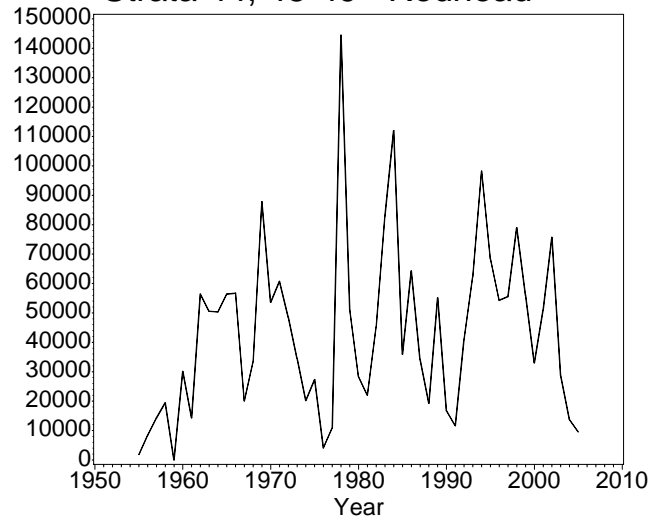
Strata 44, 48-49 Northern shoveler



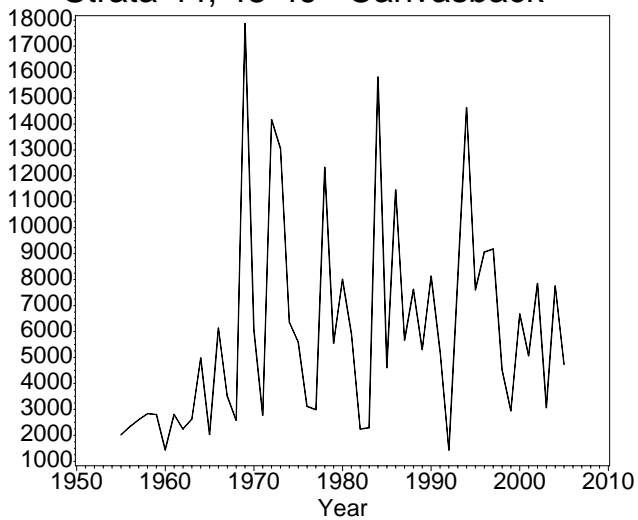
Strata 44, 48-49 Northern pintail



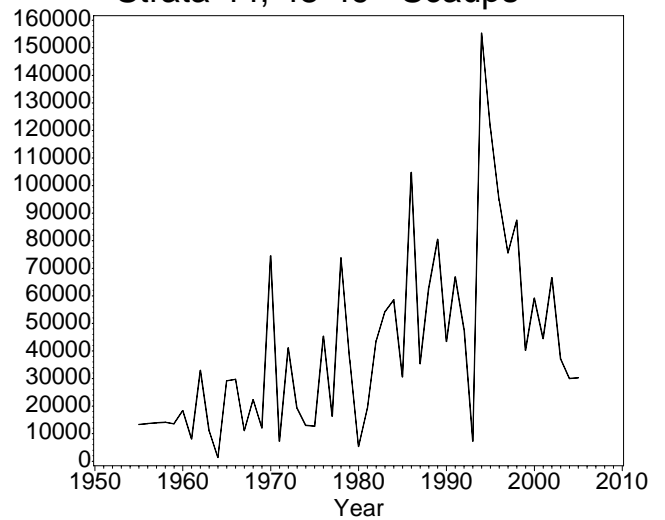
Strata 44, 48-49 Redhead



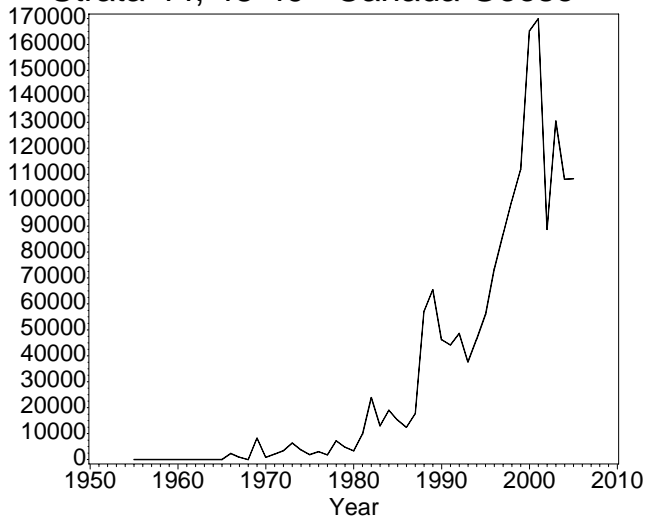
Strata 44, 48-49 Canvasback



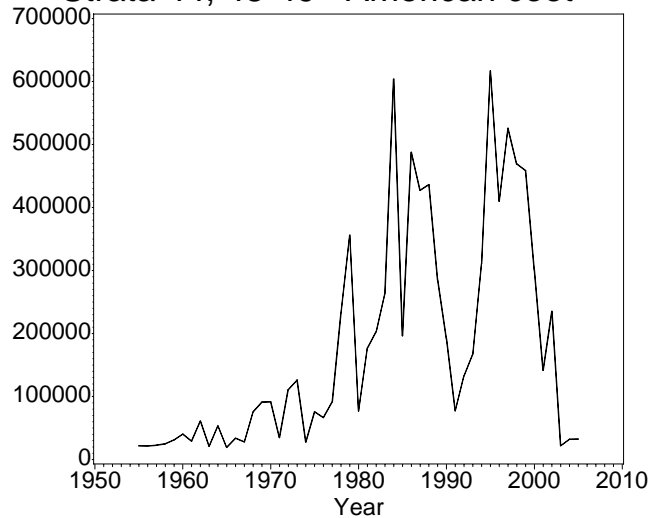
Strata 44, 48-49 Scaups



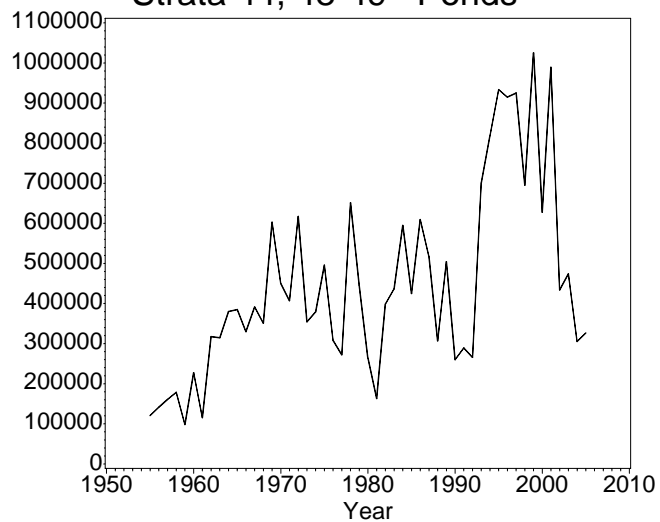
Strata 44, 48-49 Canada Goose



Strata 44, 48-49 American coot



Strata 44, 48-49 Ponds



Strata 44, 48-49 Total Ducks

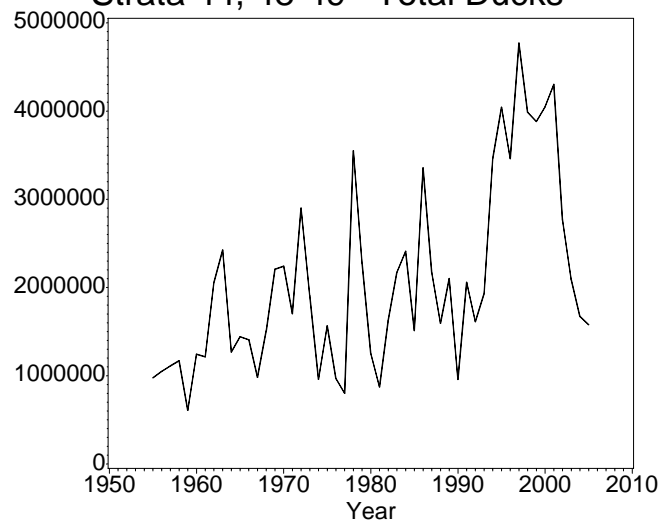


Table 4. Status of waterfowl breeding population estimates (thousands, adjusted for visibility bias) by species and stratum with comparisons against the previous year, the previous 10-year mean, and the long-term mean (from 1958) for North Dakota.

Species/Ponds	Stratum (2005)				2005 Total	2004 Total	10-Year Mean	Long-Term Mean	% Change From		
	43	45	46	47					2004	10-Year Mean	Long-Term Mean
Ducks											
Dabblers											
Mallard	100.0	586.3	331.1	53.5	1070.8	1152.9	1272.0	621.4	-7.1%	-15.8%	72.3%
Am. black duck	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	--	--	--
Gadwall	40.2	313.3	163.4	5.5	522.4	846.2	846.1	383.4	-38.3%	-38.3%	36.3%
Am. wigeon	11.4	30.8	23.1	0.0	65.3	56.2	81.5	46.0	16.1%	-19.9%	41.9%
Am. green-winged teal	13.1	15.5	11.9	0.0	40.6	99.6	61.4	37.0	-59.3%	-33.9%	9.6%
Blue-winged teal	61.4	629.2	255.3	7.2	953.0	1096.3	1687.3	885.6	-13.1%	-43.5%	7.6%
N. shoveler	34.4	278.3	108.2	8.4	429.4	350.8	499.6	277.9	22.4%	-14.0%	54.5%
N. pintail	12.1	120.2	79.4	1.1	212.8	237.1	315.5	336.2	-10.2%	-32.6%	-36.7%
Subtotal	272.6	1974.0	972.4	75.7	3294.7	3839.1	4763.3	2587.4	-14.2%	-30.8%	27.3%
Divers											
Redhead	1.7	79.0	23.2	0.0	103.9	161.3	221.4	136.8	-35.6%	-53.1%	-24.1%
Canvasback	1.4	21.0	5.5	0.0	27.9	37.5	43.9	29.8	-25.6%	-36.4%	-6.3%
Scaups	2.9	64.1	38.1	0.0	105.0	232.1	140.2	75.0	-54.8%	-25.1%	40.0%
Ring-necked duck	3.1	2.8	3.2	0.5	9.6	2.5	15.1	8.3	276.0%	-36.5%	15.8%
Goldeneyes	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	--	-100.0%	-100.0%
Bufflehead	0.0	0.0	0.3	0.0	0.3	0.6	2.3	1.4	-53.6%	-88.6%	-80.9%
Ruddy Duck	23.7	102.8	11.6	0.0	138.1	176.7	154.0	95.1	-21.8%	-10.4%	45.3%
Subtotal	32.6	269.7	81.8	0.5	384.6	610.7	577.0	346.4	-37.0%	-33.3%	11.0%
Miscellaneous											
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Scoters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	-100.0%
Mergansers	0.9	0.0	0.0	0.0	0.9	0.3	1.2	0.8	176.0%	-27.6%	10.5%
Subtotal	0.9	0.0	0.0	0.0	0.9	0.3	1.2	0.8	176.0%	-27.6%	9.1%
Total Ducks	306.1	2243.7	1054.2	76.2	3680.3	4450.1	5341.5	2934.6	-17.3%	-31.1%	25.4%
Canada Goose	11.9	137.5	86.0	4.4	239.8	183.8	118.5	31.8	30.4%	102.2%	654.5%
Am. coot	5.9	69.8	8.2	0.5	84.4	525.8	856.5	397.3	-84.0%	-90.2%	-78.8%
Ponds	184.7	373.2	174.9	28.2	761.1	804.5	988.8	735.2	-5.4%	-23.0%	3.5%

Table 5. Long-term trend in adjusted May pond estimates (thousands) by stratum with comparisons against the previous year, the previous 10-year mean, and the long-term mean (from 1974) for North Dakota. Estimates prior to 1974 were not adjusted for visibility bias.

Year	Stratum				Total
	43	45	46	47	
1961	11.8	38.2	26.3	9.6	85.8
1962	25.5	132.6	97.1	17.4	272.6
1963	41.6	206.2	150.9	17.4	416.1
1964	29.4	107.2	41.4	10.4	188.5
1965	51.3	199.4	103.8	13.9	368.4
1966	55.7	265.5	182.9	36.5	540.6
1967	50.1	311.7	168.8	29.9	560.6
1968	54.0	141.1	109.9	11.7	316.8
1969	89.5	326.2	169.9	31.6	617.2
1970	101.5	473.0	152.4	29.2	756.1
1971	109.4	365.5	87.4	17.0	579.3
1972	130.9	338.2	148.0	35.3	652.4
1973	88.4	167.4	54.0	11.8	321.6
1974	64.7	950.9	179.3	57.3	1252.2
1975	104.9	703.4	286.0	41.4	1135.8
1976	84.0	505.1	221.8	37.4	848.2
1977	88.2	179.2	60.1	12.8	340.3
1978	123.7	304.2	195.2	14.2	637.3
1979	87.0	447.4	268.5	32.9	835.8
1980	65.4	179.5	89.4	11.1	345.5
1981	70.3	208.4	55.2	9.7	343.5
1982	140.5	443.2	183.4	19.0	786.0
1983	80.0	398.1	147.5	23.3	648.9
1984	113.9	554.6	269.2	27.7	965.4
1985	115.0	355.5	126.6	17.6	614.6
1986	120.0	381.2	201.7	25.8	728.8
1987	134.5	281.2	170.4	15.1	601.1
1988	94.7	135.4	74.8	8.7	313.6
1989	116.4	198.6	117.5	15.5	448.0
1990	72.8	64.9	39.5	8.0	185.2
1991	72.4	59.1	36.1	7.7	175.3
1992	119.6	146.7	47.9	9.4	323.6
1993	106.4	167.3	163.0	18.4	455.1
1994	203.2	412.0	275.5	27.9	918.7
1995	197.0	581.6	348.0	34.1	1160.6
1996	193.9	545.0	386.1	55.8	1180.7
1997	163.0	558.8	393.3	42.4	1157.6
1998	159.4	462.4	359.0	64.0	1044.8
1999	137.5	895.5	361.3	45.6	1439.9
2000	105.1	363.2	242.4	23.6	734.3
2001	86.2	414.9	222.1	26.9	750.2
2002	96.4	373.7	192.5	19.9	682.5
2003	107.0	499.4	277.1	49.5	933.1
2004	159.3	455.4	163.8	26.0	804.5
2005	184.7	373.2	174.9	28.2	761.1
10-year Mean	140.5	515	294.6	38.8	988.8
Long-term Mean	115.6	394.4	198.5	26.7	735.2
Percent Change:					
From 2004	16.00%	-18.00%	6.80%	8.60%	-5.40%
From 10-year Mean	31.50%	-27.50%	-40.60%	-27.20%	-23.00%
From Long-term Mean	59.90%	-5.40%	-11.90%	5.60%	3.50%

Appendix 2. Long-term trend in adjusted waterfowl breeding population estimates (thousands) in North Dakota.

Species/Ponds	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Ducks										
Dabblers										
Mallard	402.4	162.2	288.5	225.9	238.1	512.8	271.1	430.2	507.1	545.0
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	44.8	13.4	85.2	56.4	156.2	213.8	86.0	226.8	269.5	216.2
Am. wigeon	24.7	24.9	22.8	5.0	3.8	16.4	4.6	5.9	18.6	27.9
Am. green-winged teal	4.5	0.0	0.0	6.8	0.0	2.2	0.0	3.3	60.9	26.9
Blue-winged teal	528.7	316.4	519.5	295.6	755.2	686.6	584.5	913.5	1041.7	1106.1
N. shoveler	62.9	45.3	184.8	106.8	271.5	221.0	102.8	289.4	290.4	403.8
N. pintail	330.4	62.8	632.7	244.9	429.6	320.7	230.3	478.6	495.3	544.9
Subtotal	1398.3	625.0	1733.4	941.4	1854.5	1973.5	1279.2	2347.6	2683.5	2870.8
Divers										
Redhead	34.1	15.3	88.9	39.3	91.2	97.4	58.5	117.1	203.1	163.1
Canvasback	30.7	6.9	13.2	3.1	2.2	14.7	17.2	19.0	53.6	26.5
Scaups	11.7	22.1	40.7	18.3	77.7	15.1	3.0	14.0	15.5	22.1
Ring-necked duck	0.0	0.0	2.9	0.0	0.0	0.9	0.0	0.0	2.5	0.0
Goldeneyes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0
Bufflehead	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0
Ruddy Duck	1.6	23.8	44.3	23.3	27.5	18.2	5.4	9.0	33.4	41.8
Subtotal	78.1	68.1	190.0	84.0	198.6	146.3	84.1	159.3	309.4	253.6
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.2	0.0
Subtotal	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.2	0.0
Total Ducks	1476.4	693.1	1923.4	1025.5	2053.1	2120.0	1363.3	2507.2	2993.2	3124.4
Canada Goose	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Am. coot	59.0	94.4	82.0	51.1	104.0	47.4	14.2	93.8	150.5	203.3
Ponds										
Species/Ponds	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Ducks										
Dabblers										
Mallard	434.6	462.6	736.6	769.3	674.0	547.2	458.4	566.5	368.0	292.1
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	352.9	323.1	373.9	372.2	353.6	223.2	213.6	330.1	76.5	103.0
Am. wigeon	8.3	40.5	30.0	28.1	29.1	36.0	44.1	72.8	62.3	31.7
Am. green-winged teal	12.4	67.0	138.6	23.4	51.0	38.0	75.0	59.4	17.4	7.4
Blue-winged teal	749.7	902.9	712.7	1238.1	780.3	588.7	1171.3	1051.4	357.0	282.2
N. shoveler	194.8	304.0	454.9	219.4	289.9	129.7	219.5	225.2	89.7	71.2
N. pintail	169.4	693.7	831.6	690.0	749.1	257.1	487.1	455.6	208.6	91.1
Subtotal	1922.2	2793.9	3278.5	3340.4	2926.9	1819.9	2669.0	2761.1	1179.5	878.6
Divers										
Redhead	93.3	177.1	153.5	123.7	126.9	94.6	110.7	214.8	63.6	31.9
Canvasback	17.3	58.9	24.7	14.7	30.2	28.5	63.0	39.3	15.3	10.3
Scaups	16.6	36.3	28.3	28.2	30.4	41.9	37.3	70.3	54.1	19.7
Ring-necked duck	0.0	0.6	2.8	1.1	0.7	0.0	0.6	1.2	1.1	1.4
Goldeneyes	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
Bufflehead	0.0	0.0	1.8	0.0	2.6	0.5	0.0	0.0	0.7	0.0
Ruddy Duck	15.5	45.2	86.0	47.0	55.1	40.7	167.0	125.1	22.8	21.1
Subtotal	142.8	318.0	297.1	214.7	247.1	206.1	378.5	450.7	157.7	84.4
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	0.0	2.9	0.0	0.0	1.4	0.7	0.7	0.0	0.0	0.0
Subtotal	0.0	2.9	0.0	0.0	1.4	0.7	0.7	0.0	0.0	0.0
Total Ducks	2065.0	3114.7	3575.6	3555.1	3175.4	2026.7	3048.2	3211.8	1337.2	963.0
Canada Goose	0.0	0.0	0.0	0.0	0.0	3.8	0.9	3.3	2.2	3.8
Am. coot	127.5	131.3	192.3	147.7	178.8	124.7	368.9	512.9	104.2	74.8
Ponds										
							1252.2	1135.8	848.2	340.3

Appendix 2 (continued). Long-term trend in adjusted waterfowl breeding population estimates (thousands) in North Dakota.

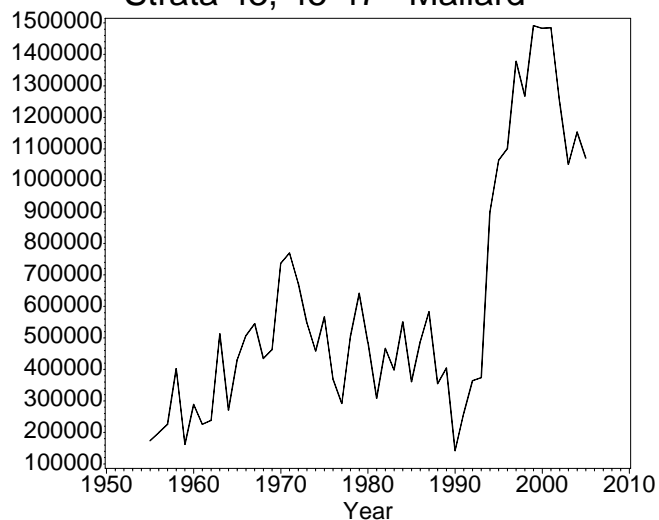
Species/Ponds	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Ducks										
Dabblers										
Mallard	506.6	641.4	485.4	308.6	466.5	398.9	550.3	361.4	487.8	582.6
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	243.9	369.2	224.3	255.6	381.2	435.0	528.8	274.0	287.7	275.9
Am. wigeon	69.4	47.4	84.0	119.2	41.5	45.1	38.7	58.9	30.9	44.1
Am. green-winged teal	20.5	25.4	92.4	39.2	52.6	16.4	16.2	58.9	20.1	33.5
Blue-winged teal	737.4	826.5	888.4	252.8	906.3	545.7	861.0	547.0	871.8	579.4
N. shoveler	277.5	447.3	181.9	264.1	377.4	194.3	273.3	153.2	244.7	255.5
N. pintail	588.5	517.3	291.8	135.2	369.4	329.4	375.5	198.9	260.0	191.6
Subtotal	2443.7	2874.5	2248.2	1374.7	2594.9	1964.8	2643.7	1652.3	2202.9	1962.8
Divers										
Redhead	191.8	198.3	122.7	75.2	258.2	226.3	170.3	116.9	103.5	99.0
Canvasback	17.0	42.7	28.5	31.9	32.4	12.4	50.9	20.1	36.3	28.7
Scaups	99.8	199.2	47.7	107.5	103.9	92.6	120.8	102.1	129.4	91.4
Ring-necked duck	2.2	8.4	3.6	0.0	11.6	103.0	12.2	3.5	11.6	3.2
Goldeneyes	0.0	0.0	0.0	0.0	0.0	2.5	1.4	0.0	0.0	1.0
Bufflehead	1.0	2.4	1.4	1.0	0.7	3.7	7.1	0.5	0.8	0.0
Ruddy Duck	123.3	98.0	111.4	237.6	357.1	184.8	251.8	111.9	170.1	113.9
Subtotal	435.0	549.0	315.4	453.2	763.9	625.2	614.4	355.0	451.7	337.2
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	0.0	0.0	0.0	0.0	0.3	6.3	2.7	0.5	0.0	0.5
Subtotal	0.0	0.0	0.0	0.0	0.3	6.3	2.7	0.5	0.0	0.5
Total Ducks	2878.7	3423.5	2563.6	1827.9	3359.1	2596.3	3260.8	2007.8	2654.6	2300.5
Canada Goose	0.9	2.7	3.7	7.4	22.4	10.5	13.7	11.3	17.0	12.3
Am. coot	389.6	1358.1	396.0	374.7	561.3	411.0	898.9	309.7	313.2	530.3
Ponds	637.3	835.8	345.5	343.5	786.0	648.9	965.4	614.6	728.8	601.1

Species/Ponds	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Ducks										
Dabblers										
Mallard	354.9	404.0	142.2	261.8	364.1	374.1	900.7	1063.9	1100.5	1377.7
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	294.9	296.3	296.0	197.9	388.7	285.8	433.3	757.4	806.3	893.8
Am. wigeon	40.8	15.6	22.9	20.9	44.1	13.9	71.4	92.0	78.9	83.2
Am. green-winged teal	28.3	9.5	26.7	9.1	14.1	9.0	60.5	45.9	90.6	79.0
Blue-winged teal	553.9	338.5	230.4	233.4	401.4	303.1	1088.8	1463.1	1764.1	1544.6
N. shoveler	118.4	158.7	67.1	75.2	114.7	175.1	507.8	573.6	653.8	492.2
N. pintail	149.7	109.0	61.8	49.3	112.1	126.9	375.5	424.9	351.5	418.1
Subtotal	1541.1	1331.5	847.1	847.7	1439.2	1288.0	3438.0	4420.8	4845.8	4888.7
Divers										
Redhead	55.2	133.4	17.0	14.7	78.8	102.2	155.0	218.2	257.9	216.5
Canvasback	19.2	39.2	10.1	8.6	17.3	19.8	56.1	42.0	58.6	69.2
Scaups	83.0	38.8	43.6	89.9	23.0	36.6	109.6	108.5	91.5	115.5
Ring-necked duck	10.5	10.9	9.6	5.0	10.3	0.4	15.7	44.4	12.1	11.2
Goldeneyes	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0
Bufflehead	0.5	2.1	0.5	3.2	3.3	2.5	4.7	3.6	1.8	2.0
Ruddy Duck	12.6	55.3	62.5	14.0	29.5	33.9	105.6	78.6	72.8	180.2
Subtotal	181.1	279.7	143.3	135.5	162.0	195.4	447.3	495.3	494.7	594.6
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	0.0	0.7	4.3	3.2	0.0	0.3	0.5	1.4	0.3	0.9
Subtotal	0.0	0.7	4.3	3.7	0.0	0.3	0.5	1.4	0.3	0.9
Total Ducks	1722.2	1611.9	994.7	986.9	1601.3	1483.7	3885.8	4917.5	5340.8	5484.3
Canada Goose	18.0	34.9	26.6	18.0	32.1	21.2	40.9	55.5	51.8	69.5
Am. coot	429.1	246.8	161.7	58.1	84.1	113.9	608.0	1675.9	1241.9	1715.3
Ponds	313.6	448.0	185.2	175.3	323.6	455.1	918.7	1160.6	1180.7	1157.6

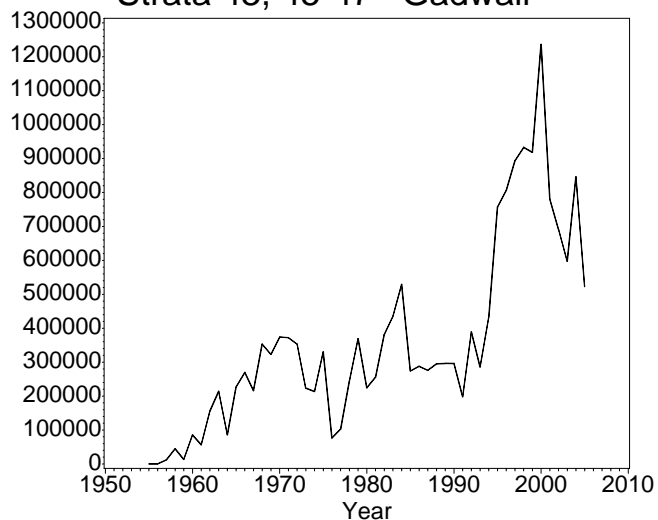
Appendix 2 (continued). Long-term trend in adjusted waterfowl breeding population estimates (thousands) in North Dakota.

Species/Ponds	1998	1999	2000	2001	2002	2003	2004	2005
Ducks								
Dabblers								
Mallard	1267.7	1490.9	1482.8	1484.3	1247.7	1051.1	1152.9	1070.8
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Gadwall	932.9	918.4	1236.3	780.3	691.5	597.4	846.2	522.4
Am. wigeon	101.0	69.1	98.0	82.5	87.5	66.3	56.2	65.3
Am. green-winged teal	48.4	55.5	44.4	44.7	66.3	39.1	99.6	40.6
Blue-winged teal	1734.6	2068.0	2848.5	1688.7	1338.3	1327.1	1096.3	953.0
N. shoveler	360.6	535.0	647.0	682.5	378.8	321.5	350.8	429.4
N. pintail	281.2	459.1	262.8	377.0	227.7	116.1	237.1	212.8
Subtotal	4726.4	5596.1	6619.8	5140.0	4037.9	3518.6	3839.1	3294.7
Divers								
Redhead	327.6	259.8	306.1	226.4	143.5	93.9	161.3	103.9
Canvasback	49.4	42.3	20.8	66.5	32.5	20.0	37.5	27.9
Scaups	148.0	120.8	178.2	130.3	136.8	140.7	232.1	105.0
Ring-necked duck	7.0	20.6	6.2	13.3	22.8	11.4	2.5	9.6
Goldeneyes	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Bufflehead	1.1	0.3	3.2	5.2	2.4	2.4	0.6	0.3
Ruddy Duck	143.3	217.3	212.3	185.0	192.6	79.0	176.7	138.1
Subtotal	676.4	661.0	728.1	626.7	530.5	347.6	610.7	384.6
Miscellaneous								
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	0.5	0.7	7.5	0.7	0.0	0.0	0.3	0.9
Subtotal	0.5	0.7	7.5	0.7	0.0	0.0	0.3	0.9
Total Ducks	5403.3	6257.9	7355.4	5767.4	4568.4	3866.1	4450.1	3680.3
Canada Goose	76.5	104.5	161.6	184.1	122.9	175.3	183.8	239.8
Am. coot	767.9	889.9	912.6	319.6	437.9	82.6	525.8	84.4
Ponds	1044.8	1439.9	734.3	750.2	682.5	933.1	804.5	761.1

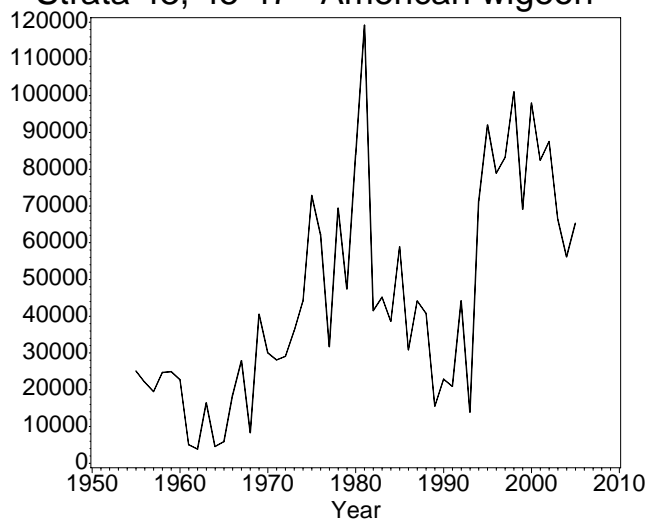
Strata 43, 45-47 Mallard



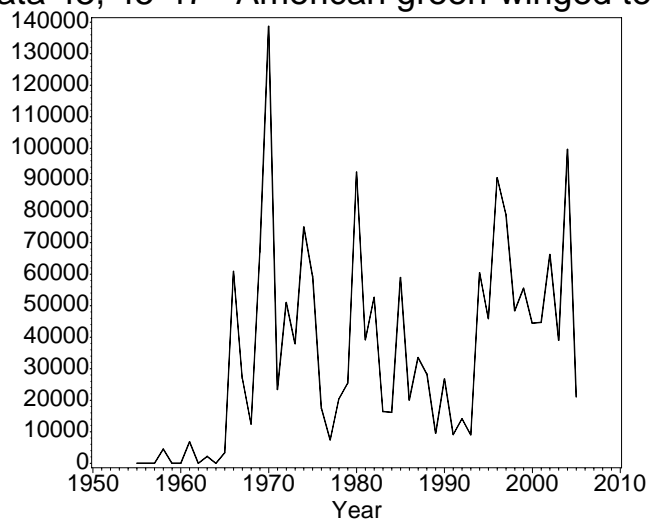
Strata 43, 45-47 Gadwall



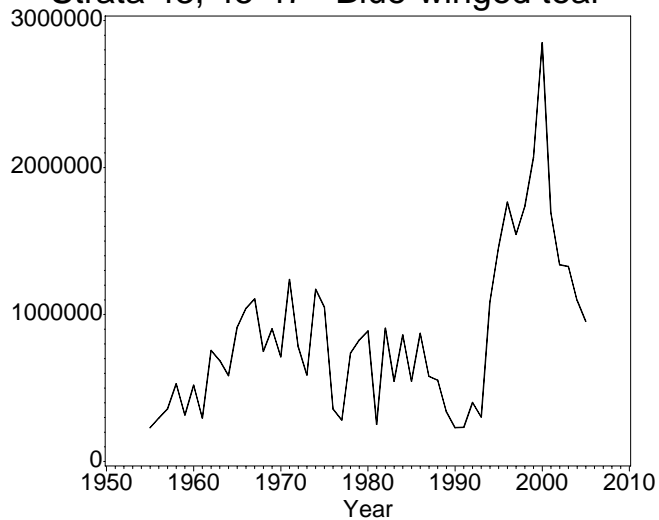
Strata 43, 45-47 American wigeon



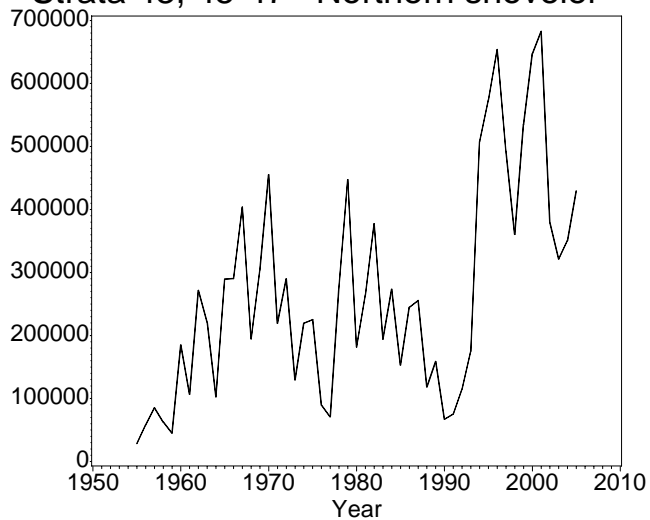
Strata 43, 45-47 American green-winged teal



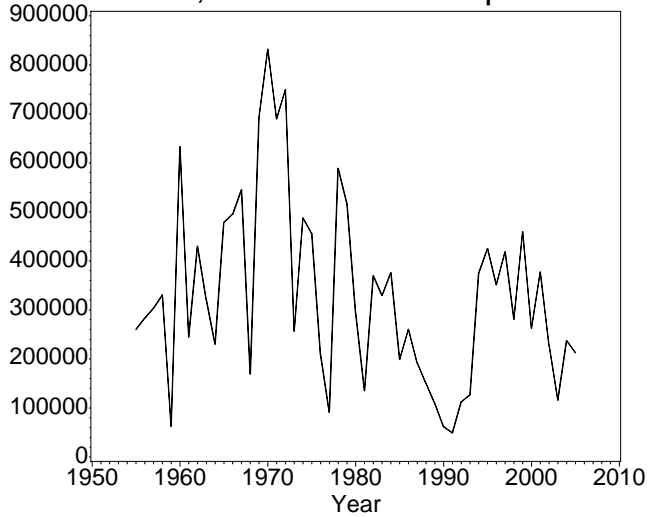
Strata 43, 45-47 Blue-winged teal



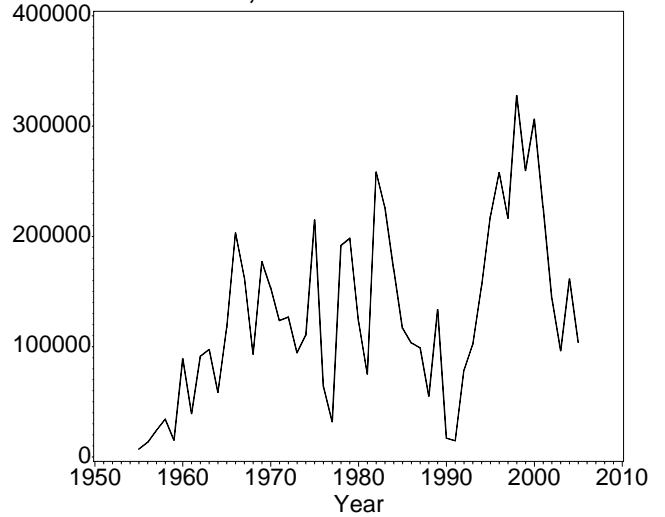
Strata 43, 45-47 Northern shoveler



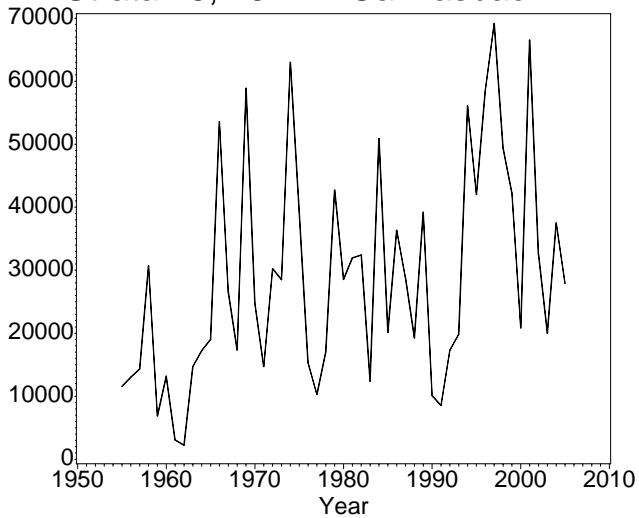
Strata 43, 45-47 Northern pintail



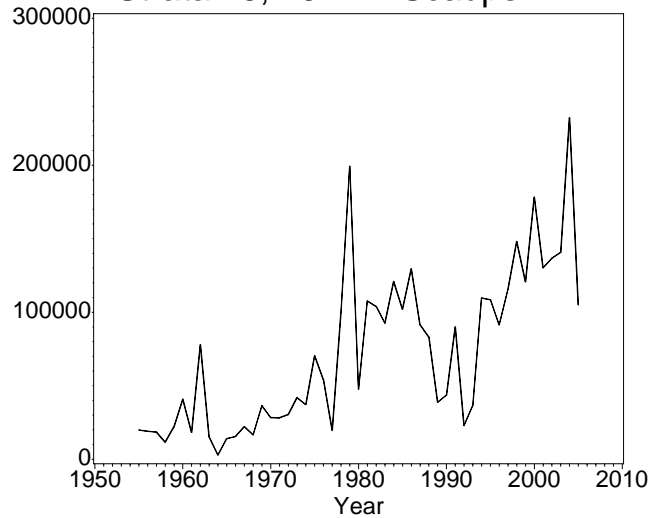
Strata 43, 45-47 Redhead



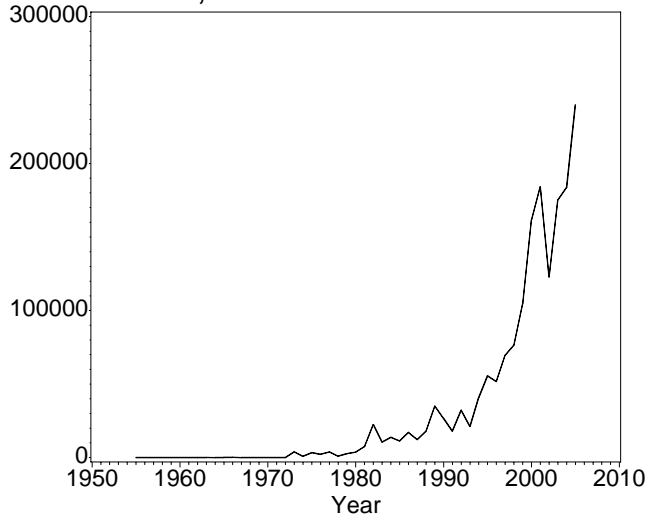
Strata 43, 45-47 Canvasback



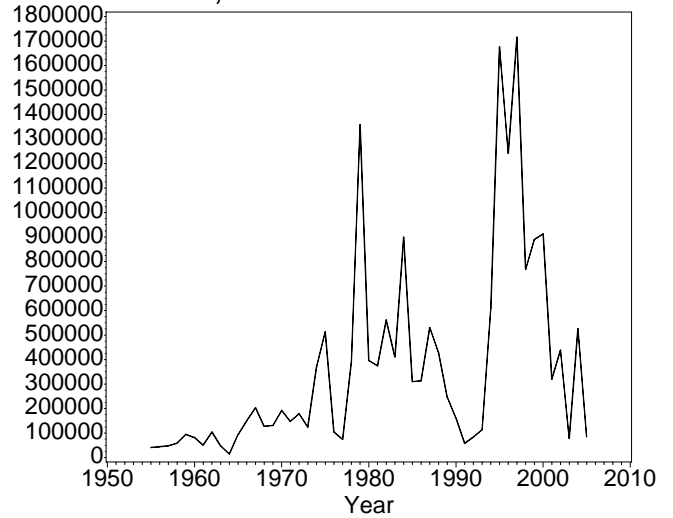
Strata 43, 45-47 Scaups



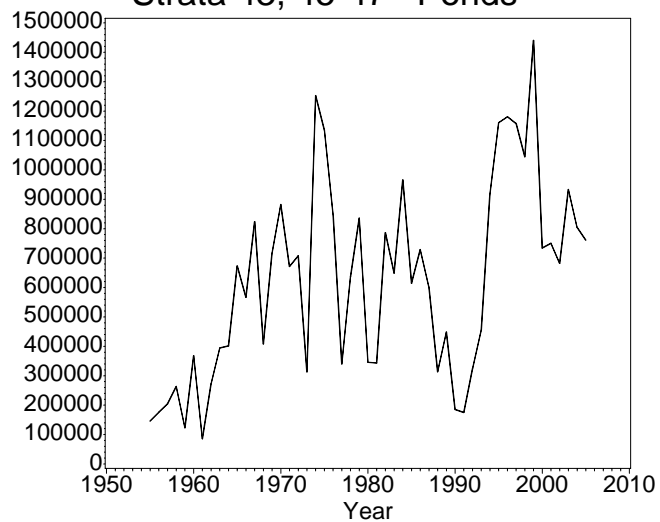
Strata 43, 45-47 Canada Goose



Strata 43, 45-47 American coot



Strata 43, 45-47 Ponds



Strata 43, 45-47 Total Ducks

